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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,227	06/13/2001	Soichiro Kawakami	35.C9574 D5	4195

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EXAMINER

CHANEY, CAROL DIANE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 07/30/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/879,227

Applicant(s)

KAWAKAMI ET AL.

Examiner

Carol Chaney

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 123-178 is/are pending in the application.
- 4a) Of the above claim(s) 127-140, 143, 145, 149-151 and 159-178 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 123-126, 141, 142, 144, 146-148 and 152-157 is/are rejected.
- 7) ☒ Claim(s) 158 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 08/159,141.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 1745

Election/Restrictions

Applicant's election of Group I, species 1 in Paper No. 8, filed 08 May 2003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 123-126, 141, 142, 144, 146, 147, 148, 152-158 are examined in this action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 144 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for lipophilic treatment of cathode coatings, does not reasonably provide enablement for lipophilic treatment of anode coatings. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1745

Claims 123-126, 141, 142-144, and 146 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regards to claim 123, and its dependent claims, the meaning of the recitation of "electrode substantially comprising" is unclear because it is unclear if the expression is intended to convey "open" or "closed" language.

In claim 125, the recitation of an ion which "is not able to pass through the negative active material" appears to be improbable. Self-diffusion of an active material such as lithium will cause that material to "pass through" itself.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 123-126, 142, 144, 143, 148, and 152-157 are rejected under 35 U.S.C. 102(b) as being anticipated by deNeufville et al., US Patent 4,624,902.

deNeufville et al. disclose coatings for electrodes used in electrochemical cells. The coated electrode may be used as an anode (column 9, lines 10-11) and in preferred embodiments lithium foil anodes are coated with SiF₄. (Note column 12, example 1.) The SiF₄ coating is considered a lipophilic treatment. The coating does not react with the electrolyte. (Column 6, lines 52-54.) deNeufville et al. teach their inventive the film

Art Unit: 1745

allows diffusion of the active species away from the electrode and into the electrolyte, and diffusion of active material through the coating. (See column 4, lines 4-12.) Thus, the film has "a molecular structure of apertures comprising openings larger than the ions of the battery reaction" since the ions move through the film.

deNeufville et al. disclose a cell formed with a SiF_4 -coated lithium anode and a FeS_2 cathode, having a filter paper separator "sandwiched between the anode and cathode. (Column 12, lines 24-54.) this sandwich arrangement is interpreted as pressing and securing the battery layers together.

Claims 123-126, 142, 146-148, 152-154, and 156 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiratani et al., US Patent 4,645,726.

Hiratani et al. disclose a solid state battery having a lithium anode and a lithium alloy layer sandwiched between the solid electrolyte and a Li anode. (Column 2, lines 59-63.) The diffusion of lithium through the lithium alloy is much faster than the diffusion of lithium through metallic lithium. Thus, the lithium alloy is a film through which lithium diffuses, and thus has openings "through which an ion of a battery reaction is able to pass." The solid electrolyte of the battery serve both as an electrolyte and as a separator. Therefore, the lithium alloy protective layer is in contact with both the negative electrode active material (lithium) and the separator layer. (See Fig. 1.)

Claims 123-126, 141, 142, 146-148, and 152-157 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiratani et al., US Patent 4,645,726.

Hiratani et al. disclose lithium batteries which include a lithium foil anode covered with 2-5 micron thick layer of nickel powder. This layer of nickel powder is considered a conductive powder dispersion film layer. (See column 5, lines 13-35.) a separator is placed on top of the nickel powder, and the cathode on top of the separator. Thus, the conductive metal layer is in contact with, and pressing, both the negative active material and the separator. As seen in Figure 4, the metal powder layer contains openings larger than lithium ions.

Allowable Subject Matter

Claim 158 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to disclose or suggest a secondary battery having a negative electrode which is substantially negative electrode active material and has a layer with carbon fibers having a surface area of $10 \text{ m}^2/\text{g}$ and a void ratio of at least 50%. The prior art suggests a variety of surface, protective coatings for negative electrodes, but fails to specifically suggest carbon fiber coatings of the claimed morphology.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 1745

Bates, US Patent 5,314,565 discloses lithium oxyphosphonitride layers on lithium anodes.

McLoughlin et al. US Patent 4,675,258 discloses protected lithium electrodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (703) 305-3777. The examiner can normally be reached on Mon - Fri 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 703-308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Carol Chaney
Primary Examiner
Art Unit 1745

cc
July 26, 2003